Cumulative Index 1986

Volume 7

March	NUTRITION AND RESPIRATORY DISEASE, pp. 1–156
June	THE UPPER AIRWAYS, pp. 157–310
September	RESPIRATORY PHARMACOLOGY, pp. 311–518
December	PULMONARY REHABILITATION, pp. 519–702

Note: Page numbers of issue and article titles are in **boldface** type.

Acetazolamide, actions and respiratory effects of, 488–489
Acetylcholine, effect of, on ion transport in trachea, 266
  in upper respiratory tract, 205–206
Acquired immunodeficiency syndrome (AIDS), TMP-SMZ for, 421
Acyclovir, for herpes simplex virus and varicella zoster infections, 459–460
Adenine arabinoside, for herpes simplex virus and varicella zoster infections, 457–459
Adrenergic agents, effect of, on ion transport in tracheal mucosa, 265–266
Adult respiratory distress syndrome (ARDS), steroid therapy for, 349
Airflow obstruction, chronic, changes in, 573–575
Airway(s), secretory cells of, regulation of, **231–237**
  upper, function of, 171
    innervation of, **201–209**
    issue on, **157–310**
    muscles of, **171–188.** See also *Muscle(s), upper airway.*
Airway epithelial ion transport, mechanisms of, **273–284**
Airway mucosa, regulation of salt and water transport across, **259–272**
Airway surface liquid, physiology of, 285–288
Airway tone, neurohumoral control of, 658–659
Albuterol, formulation of, 323
  potency of, 320
Alcohol, for asthma, 389–390
Almitrine bimesylate, actions of and respiratory effects of, 489
Alpha-adrenergic blockers, for asthma, 386–387
Alveolitis, hypersensitivity, steroid therapy for, 350
Amantadine hydrochloride, for influenza A infections, 455–457
Amdinocillin, 396–397
Amikacin, dosing for, 417
  for tuberculosis, 437
Amiloride, for cystic fibrosis respiratory epithelia, 289–291
Amino acid(s), in enteral nutritional support, 52–53
  infusion of, and metabolic rate, 13
Aminoglycosides 413–418
  side effects of and clinical indications for, 416–417
Aminopenicillins 395
Aminophylline, intravenous, dosage of, 336
Aminosalicylate, for tuberculosis, 436
Amoxicillin, 395
Amphotericin B, for pulmonary mycoses, 441–443
Ampicillin, 395
Anabolic phase, of metabolic response to injury, 30
Analeptics, actions and respiratory effects of, 486–487
Anaphylaxis, chlorpheniramine for, 379
  vancomycin for, 420
Androgens, effects of, on skeletal muscle atrophy, 106
Anesthetics, effects of, on upper airway muscle activity, 178–179
Antibiotics, for respiratory medicine, **393–412, 413–423**
  polyene macrolide, for pulmonary mycoses, 439–443
Anticholinergic agents, **355–366**
  actions of, 357
  clinical value of, 359–360
  effects on respiratory secretions and pulmonary circulation, 359
  for bronchospasm, 358–359
  for COPD, 665–667
  structure of, 355–357
Anticholinergic bronchodilators, preparations of, 363
Antidepressant drugs, for COPD, 639
Antihistamines, classic, in respiratory medicine, **367–382.** See also *H_1 blockers.*
Anti-inflammatory drugs, nonsteroidal, for asthma, 388–389
Antithrombotic therapy for thromboembolic disease, **471–475**

Antituberculosis drugs, **425–438**
adverse reactions to, 430
dosages of, 427
drug interactions with, 431
management of drug toxicity in, 428–429
Antiviral agents, **453–467**
clinical use of, 454–455
sites of action, 453–455
Antiviral nucleosides, 457–463
Apical chloride exit step, in airway epithelial ion transport, 279–281, 287
Apical membrane sodium entry step, in airway epithelial ion transport, 282, 286–287
Apnea, diving response and, 161–162
obstructive sleep, alterations in blood pressure and, 177–178
pathophysiology of, 182–183
respiratory muscle fatigue and, 180
upper airway mechanoreceptors and, 176–177
Arachidonic acid metabolites, and IVFE-related lung function impairment, 73–76
role of, in ion transport in trachea, 266–267
Aspiration, enteral nutritional support and, 62
Aspirin, for asthma 389
Astemizole, uses of, 379
Asthma, abnormalities of upper airway function and, 183
alcohol for, 389–390
alpha-adrenergic blockers for, 386–387
alternative drug therapy for, **383–391**
anticholinergic agents in, 355–366
anticholinergic *v* sympathomimetic bronchodilators in, 360
beta-adrenergic drugs in, 315
therapeutic effects of, 318–321
calcium-channel-blocking agents for, 387–388
cromolyn sodium for, 383–385
doxantrazole sodium for, 386
ethanol for, 390
H_1 blockers for, 375–376, 378
ipratropium in, 364
ketotifen for, 385–386
lodoxamide for, 386
nonsteroidal anti-inflammatory drugs for, 388–389
steroid therapy for, 344–345, 349, 351
suppressive agents for, 389–390
Atropine, actions of, 357
for COPD, 666–667
methonitrate, uses of, 363
pharmacology and side effects of, 361–362
structure of, 356–357
uses of, 362
Azole derivatives, for pulmonary mycoses, 444–449
Azotemia, enteral nutritional support and, 63–64
Aztreonam, for pneumonia, 403

Basolateral membrane sodium pump, in airway epithelial ion transport, 281, 287
Basolateral potassium exit step, in airway epithelial ion transport, 281–282, 287
Beclomethasone, for asthma, 348
Benzodiazepines, actions and respiratory effects of, 483–484
for COPD, 639
Beta-adrenergic drugs, **313–329**
administration of, 322–326
in asthma, therapeutic effects of, 318–321
diagnostic use of, 321
interactions with other drugs, 322
mechanism of action of, 314–315
in asthma, 315
pharmacokinetics of, 315–318
side effects of, 321–322
structure–activity relation in, 313–314
Beta-lactam antibiotics, 393–404
adverse reactions to, 397
Beta-lactamase inhibitors, 397
Betamethasone, 348
Blood flow, in diaphragm, 80–81
Blood pressure, alterations in, in upper airway muscle activity, 177–178
Body composition, effects of carbohydrate on, 5
effects of varying energy and nitrogen intake on, **3–17**
in hospital malnutrition, 21–22
in partial starvation, 20–21
Body weight, components of, 42
and respiratory muscle dimensions, 92
and respiratory muscle strength, 93
Bombesin, in upper airway muscle activity, 205
Breathing, controlled slow deep, 604
diaphragmatic, exercises for, 604–610
in COPD, results of, 605–610
in pulmonary rehabilitation, 526
technique of, 605
oral, abnormalities of upper airway function and, 184
pattern of, laryngeal receptors mediating, 218–220
pursed lip, 600–601
resting, upper airway muscle activity during, 174–175
Breathing training, in COPD, 600–610
Bronchial muscle tone, neuropeptides and, 267
Bronchitis, acute TMP–SMZ for, 421
steroid therapy for, 349
Bronchoconstriction, abnormalities of upper airway function and, 183
anticholinergic agents for, 358–359
effect of, on upper respiratory muscle activity, 178
laryngeal receptors mediating, 218
Bronchodilation, beta-adrenergic drugs and, 318–321
H_1 blockers and, 373–375
Bronchodilators, anticholinergic, preparations of, 363
anticholinergic *v* sympathomimetic, 360
sympathomimetic, 659–662
Bronchomotor tone, leukotriene regulation for, 192–193
peptide regulation for, 193–195
Bronchospasm, anticholinergic *v* sympathomimetic bronchodilators in, 360
exercise-induced, cromolyn sodium for, 384–385
Bronchi, ion transport across, 263
Budesonide, 348

Caffeine, actions and respiratory effects of, 487
Calcitonin-gene-related peptide, in upper respiratory tract, 204–205
Calcium, role of, in ion transport in trachea, 268
sources of, for contraction in tracheal smooth muscle, 190–191
Calcium-channel-blocking agents, for asthma, 387–388
Caloric intake, and nitrogen balance, 4
Calorie requirements, for IV nutritional support, 34–35
Capreomycin, for tuberculosis, 434
Capsaicin, for substance P, in upper airways, 203–204
Carbapenems, 403–404
Carbenicillin, 395–396
Carbohydrates, in enteral nutritional support, 53
and nitrogen balance, 4–5
Carbon dioxide, pharmacology of, 499–502
physiologic effects of, 501
therapeutic uses of, 501–502

Cardiovascular function, metabolism, and respiration, enteral nutritional support and, 41–50
Catabolic illness, acute, IV nutrition for, 31
Catabolic phase, of metabolic response to injury, nutritional support in, 30–31
Catecholamines, metabolism of, 318–319
CCNU, for lung cancer, 510–511
Cefaclor, 401
Cefadroxil, 400
Cefamandole, 400
Cefazolin, 399–400
Cefonicid, 401
Cefoperazone, 401
Ceforanide, 401
Cefotaxime, 401
Cefoxitin, 400
Cefsulodin, 402
Ceftazidime, 402
Ceftizoxime, 401
Ceftriaxone, 401
Cefuroxime, 400
Cephalexin, 400
Cephalosporins, 398–403
  pharmacology of, 405
  use of, 402–403
Cephalothin, 399
Chemical mediators, effect of, on mucociliary clearance, 253–254
Chemotherapeutic agents, for lung cancer, **505–513**
  pharmacology and dosage of, 506
Chloramphenicol, uses and side effects of, 406–407
Chloride, apical exit step, in airway epithelial ion transport, 279–281, 287
Chloride entry step, in airway epithelial ion transport, 272–279, 287
Chloride secretion, in cystic fibrosis, 303–304
  in dog tracheal epithelium, 302
Chlorpheniramine, for anaphylaxis, 379
  for bronchodilation, 373–375
Chronic obstructive pulmonary disease (COPD), anticholinergic agents for, 665–667
  anticholinergic *v* sympathomimetic bronchodilators in, 360
  breathing exercises in, results of, 605–610
  breathing training in, 600–610
  case history of, 634–635
  chest physical therapy in, 610–616
  chronic hypoxia, and neuropsychological deficits in, 631–632
  dyspnea in, 530
  effects of, 632–633
    on respiratory muscles, 147–149
  effects of malnutrition on, 141
  exercise in, **585–597.** See also *Exercise, in COPD.*
  exercise testing in, 586–588
  family and, 633–634
  functional changes during nutritional repletion in, **141–151**
  glucocorticoids for, 667–668
  home oxygen therapy in, **673–678**
    recent clinical trials in, 673–676
  influence of nutritional effects on respiratory muscles in, 107–108
  intermittent hypoxemia in, 676–677
  learning needs assessment for patients with, 623
  malnutrition in, effects of, 648–651
    potential causes of, 645–648
    management of, goals in, 520–521
    patients with, 634–635
  methylxanthines for, 662–665
  need for oxygen in, 588–589
  nutrition and, **643–656**
  nutritional assessment in, 651–652
  oxygen supply system and, 677
  pattern of exercise response in, 585–586
  pharmacotherapy of, **657–671**
  prediction of maximal exercise ventilation in, 586
  psychiatric disease and, 639
  psychological characteristics associated with, 629–631
  psychological problems associated with, 530–532
  psychosocial adjustment of patients with, 632
  psychosocial issues in, **629–642**
  psychotropic medications for, 639–640
  rehabilitation in, biobehavioral techniques for, 637
    goal setting in, 637
    issue on, **519–691.** See also *Pulmonary rehabilitation.*
    socialization and education in, 638–639
  repletion in, case report of, 142–144
    methods of, 142–143
  severe hypoxemia in, 528–529
  starvation and experimental emphysema and, 644–645
  sympathomimetic agents for, 659–662
  therapeutic approaches for, 636–637
  therapy for, staging of, 668–669
  weight loss and, 144–147, 643–644
Cilia, activity of, in normal mucociliary function in trachea, 248–249
  structural defects of, in trachea, 251–252
Ciliary dyskinesia, ciliary dysfunction in, 251–252
Ciliated cells, of tracheal surface epithelium, 231–232
Cilioinhibition, in trachea, 252
Cisplatin, for lung cancer, 510
Clavulanic acid, 397
Clenbuterol, metabolism of, 316–318
Clindamycin, uses and side effects of, 409
Clobetasol, 348
Clofazimine, for tuberculosis, 436
Colistin, 418
Colterol, formulation of, 323
COPD. See *Chronic obstructive pulmonary disease.*
Cortisone, 347
Coughing, laryngeal receptors mediating, 217–218
Coumarin-like drugs, for thromboembolic disease, 473–475
Cromolyn sodium, for asthma, 383–385
  for exercise-induced bronchospasm, 384–385
Crutch reflex, 167–168
Cushingism, steroids and, 344–345
Cyclophosphamide, for lung cancer, 505–507
Cycloserine, for tuberculosis, 435
Cystic fibrosis, abnormal respiratory epithelial ion transport in, **285–297**
  amiloride for, 289–291
  causes and treatment of, 288
  dysfunction in nonrespiratory epithelia in, 293–294
  ion transport by cultured airway epithelial cells in, 302–304
  isproterenol for, 290–294, 303
  research goals in, 294–295
  sweat glands and, 293–294

Depletion, chronic, IV nutrition for, 31–32
  effect of varying energy and nitrogen intake on, 9–11
  fluid and electrolyte balance in, 10–11
  glucose *v* fat in, 10
Depression, as potential cause of malnutrition in COPD, 647–648
  COPD and, 630
Deptropine, for asthma, 365
Dexamethasone, 347–348

DHPG, for herpes simplex virus and varicella zoster infections, 462–463
Diaphragm, development of, 84. See also *Respiratory muscles.*
role of, in inspiration, 568–570
Diaphragmatic breathing, in pulmonary rehabilitation, 526
Diazepam, for dyspnea, 485–486
Diet, effects of, on body protein in normals, 3–5
Dihydrocodeine, for dyspnea, 486
Diphenhydramine, uses of, 379
Diving response, and cardiovascular changes, 161–162
apnea and, 161–162
Doxantrazole sodium, for asthma, 386
Doxepin, uses of, 379
Doxorubicin, for lung cancer, 507–508
Drugs, effect of, on upper airway muscle activity, 178–179
Dyspnea, desensitization to, with improved exercise endurance, 593
fear of, and COPD, 630
in COPD, 530
management of, 485–486

Ebb phase, of metabolic response to injury, 30
Edema, pulmonary, safety factors of, 128–129
Elemental enteral formulas, 54–55
Emphysema, experimental, starvation and, in COPD, 644–645
starvation and, 111–112
Energy, and nitrogen intake, effects of varying, on nitrogen balance, body composition, and metabolic rate, **3–17**
Enteral formulas, categories and selection of, 54–59
components of, 52–54
metabolic effects of, **54–59**
Enteral nutritional support, **41–67**
at home, 64–65
delivery dose and rate of, 59
delivery method for, 52
feeding tube selection and placement for, 51–52
indications for, 51–65
monitoring and complications of, 59–64
Enteral pumps, 52
Ephedrine, formation of, 323
metabolism of, 318
side effects of, 321–322
Epinephrine, effect of, on cell-membrane resistance, in airway epithelial ion transport, 279–280
formulations of, 323
metabolism of, 316–318
side effects of, 321
subcutaneous administration of, 325
Epithelial cells, cultured airway, ion transport by, **299–305**
Epithelial membrane transport, structure–function relations in, 259–261
Epithelium(a), nonrespiratory, dysfunction in, in cystic fibrosis, 293–294
structure and function of, 273–274
surface, of trachea, cells of, 231–233
Erythromycin, for legionnaires' disease, 408
uses and side effects of, 407–409
EFAD. See *Essential fatty acid deficiency.*
Essential fatty acid deficiency (EFAD), prevention of, 34–35, 69–70
Ethambutol, for tuberculosis, 434–435
Ethanol, actions and respiratory effects of, 484–485
for asthma, 390
Ethionamide, for tuberculosis, 435–436
Etoposide, for lung cancer, 509–510
Exercise, and hyperpnea, 167–168
in COPD, **585–597**
improvement in tolerance, 592–593
intensity of, 593–594
type of, 594
program of, in pulmonary rehabilitation, 523–525
thermal reactions to, 50
Exercise response, in COPD, pattern of, 585–586
Exercise testing, in COPD, 586–588
response to, 590–592
in normal subjects, response to, 589–590

Fasting. See also *Malnutrition, Nutrition, Starvation.*
effects of, on lung growth, 124
on protein metabolism, 122–123
on surfactant function of lung, 120–122
lung mechanics in, 114–118
lung morphology in, 118–120
lung weight in, 114
malnutrition and, 23
state of, 42–44
static inflation and deflation V–P curves in, 115–116
Fat(s), in enteral nutritional support, 53
and nitrogen balance, 4–5
v glucose, in the acutely ill, 8
in depletion, 10
Fibrinolytic therapy for thromboembolic disease, **475–480**
Fibrosis, idiopathic, steroid therapy for, 350
Fluid and electrolyte balance, in depletion, 10–11
5-Fluorocytosine, for pulmonary mycoses, 443–444
Fluconazole, for pulmonary mycoses, 447–449
Flunisolide, for asthma, 348
Formula. See *Enteral formulas.*
Fuel storage, 29–30
Fuel stores, during starvation, 30
Furosemide, effect of, on cell-membrane resistance, in airway epithelial ion transport, 278

Ganglion cells, tracheal, and parasympathetic motor pathways, 224–229
Gastrin-releasing peptide, in upper respiratory tract, 205
Genioglossus muscle, effect of hypercapnia and hypoxia on, 175
Gentamicin, dosing for, 417
Gland cells, submucosal, isolation and culture of, **239–245**
of trachea, 233–235
Glandular function, submucosal, 240
Glandular secretion, of airways, physiology of, 234–235
Glandular structure, submucosal, 239–240
Glucocorticoids, effects of, on skeletal muscle atrophy, 106
for COPD, 667–668
Glucogenesis, in malnutrition, 23
Glucose, *v* fat, in the acutely ill, 8
in depletion, 10
hypercaloric, and IV nutritional support, 35
infusion of, and metabolic rate, 13–14
thermic effects of, 12–13
Glycopyrrolate, uses of, 363
Goblet cells, of tracheal surface epithelium, 232

H_1 blockers, and bronchodilation, 373–375
for asthma, 375–376
effect on cardiovascular system, 376
effect on respiratory infections, 377
indications for, 378–379
old and new, 379
pharmacodynamics of, 373–378
pharmacokinetics in, 371–373
in respiratory medicine, **367–382**
side effects of, 378
structure and structure–activity relation to, 367–371
Heart failure, and IV nutritional support, 35
Helium, pharmacology of, 502–503
therapeutic uses of, 503
Hemostasis, stages in, 469–470
Heparin, for thromboembolic disease, 471–473
Hepatic encephalopathy, nutritional support for, 35–36
Histamine, effect of, on mucous secretion, 253–255
on nasal vasculature resistance, 164–165
gland secretion and, 235
Homatropine, 363
Hormones, effects of, on skeletal muscle atrophy, 105
malnutrition and, 23–24
Hydrocortisone, 346–347
L-Hyoscyamine, users of, 362–363
Hypercapnia, effects of, on respiratory muscles, 107–108
on upper airway muscles, 175–176
Hypercatabolism, following injury or sepsis, 5–7
for nitrogen balance, consequences of, 7–9
Hyperoxic exposure, effects of, 497
Hyperpnea, exercise and, 167–168
Hypertension, effect of, on upper airway muscle activity, 177–178
laryngeal receptors mediating, 218
Hypophosphatemia, enteral nutritional support and, 63
Hypothalamic–pituitary–adrenal axis suppression, steroids and, 345
Hypoxemia, arterial, causes of, 497
in severe COPD, 528–529
intermittent, in COPD, 676–677
Hypoxia, chronic, in COPD, 631–632
effects of, on respiratory muscles, 107–108
on upper airway muscles, 175–176
hormonal responses to, 108

Ibuprofen, for asthma, 389
Imipenem, 403
Indomethacin, effect of, on regulating leukotrienes, in tracheal smooth muscle, 193
for asthma, 389
Infections, respiratory, effect of H_1 blockers on, 377
severe, steroid therapy for, 349
Insulin, effect of, on skeletal muscle atrophy, 105
Interferon, for viral diseases, clinical studies and side effects of, 463–465
Interleukin 1, effects of, on skeletal muscle atrophy, 106
Intraprandial state, 45–50
Intravenous fat emulsions (IVFEs), characteristics and components of, 69–70
effects of, on lung function, in the acutely ill, 72
in normals, 71
examples of, 69–70
and lung function, **69–77**
metabolism of, 70–71
Intravenous nutritional support, for chronic depletion, 31–32
complications of, 33
component requirements for, 33–35
EFAD and, 34
goals of, 31–38
heart failure and, 35
historical perspective of, 29
hypercaloric glucose and, 35
indications for, 31–33
in pregnancy and childhood, 32
metabolic stress and, 36
monitoring during, 36
principles of, **29–39**
renal failure and, 35
route of administration for, 32–33
Ions, intracellular, composition of, and intracellular voltage, 259
Ion transport, abnormal respiratory epithelial, in cystic fibrosis, **285–297**
across bronchi, 263
airway epithelial, apical chloride exit step in, 279–281, 287
apical membrane sodium entry step in, 282, 286–287
basolateral membrane sodium pump in, 281, 287
basolateral potassium exit step in, 281–283, 287
chloride entry step in, 277–279, 287
mechanisms of, **273–284**
by cultured airway epithelial cells, **299–305**
in cystic fibrosis, 302–304
by tracheal mucosa, 263–265
fluid flow studies of, 268–269
in epithelium, 260–261
in trachea, calcium and, 268
effect of adrenergic agents on, 265–266
effect of cholinergic agents on, 266
periciliary fluid, mucociliary clearance, and, interactions of, 262–269
role of cyclic nucleotides in, 267
Ipratropium, clinical value of, 360
for bronchospasm, 364–365
Isoetharine, formulation of, 323
potency of, 320
Isoniazid, for tuberculosis, 429–432
Isoproterenol, effects of, on cystic fibrosis, 290–294, 303
formulation of, 323
for tracheal smooth muscle relaxation, 191
potency of, 320
Itraconazole, for pulmonary mycoses, 445, 447–449

Jimsonweed, history of, 355

Kanamycin, for tuberculosis, 434
Ketoadaptation, during starvation, 30
Ketoconazole, for pulmonary mycoses, 447–449
Ketotifen, for asthma, 385–386
uses of, 379
Kidney failure, and IV nutritional support, 35
Kwashiorkor, carbohydrate intake and, 5
definition of, 19–20
hormonal state in, 24
signs of, 23

Lapice's law, 569
Laryngeal receptors, reflex responses of, **211–222**
Larynx, muscles of, respiratory functions of, 173–174
respiratory functions of, **211–222**
Legionnaires' disease, erythromycin for, 408

Leukotrienes, effect of, on mucociliary function, 253–254
regulation of, for bronchomotor tone, 192–193
Lips, muscles of, respiratory functions of, 172–173
Lodoxamide, for asthma, 386
Lung(s), biochemistry of, effects of malnutrition on, 120–123
function of, and fat emulsions, **69–77**
impaired, 71–76
and arachidonic acid metabolites, 73
and IVFE infusion, 73
growth of, effects of malnutrition on, 123–125
mechanics of, in fasting and starvation, 114–118
morphology of, in fasting and starvation, 118–120
surfactant function of, in fasting and starvation, 120–122
weight of, in fasting and starvation, 114
Lung cancer, sclerosing agents in, 512–513
Lung cancer chemotherapy, pharmacologic aspects of, **505–513**
Lung disease, steroid mode of action in, 344
Lung water, distribution of, 127–128
nutrition and, **127–130**
Luxus consumption, definition of, 12

Malignancy, nutritional support and, 32
Malnutrition. See also *Fasting, Nutrition, Starvation.*
and COPD, **141–151**
and lung growth, 123–125
effect of repletion on, 147–148
fasting and, 23
forms of, in stressed and unstressed patients, **19–28**
hormones and, 23–24
implications for treatment for, 25–26
in COPD, effects of, 648–651
potential causes of, 645–648
in the hospital, 20
body composition in, 21–22
pathogenesis of, 22–23
protein intake and, 23
pulmonary edema and, 129
reductive adaptations during, 25
respiratory disease and, 113
respiratory failure and, 129
respiratory muscles and, **91–99**, 132, 147
respiratory muscle endurance and, 135
serum albumin and, 24
Marasmus, definition of, 19–20
hormonal state in, 23–24
Mechanoreceptors, upper airway, 176–177
Mefenamic acid, for asthma, 389
Metabolic fuels, oxidative and anabolic fate of, 43
Metabolic rate, basal, and thermogenesis, 11–12
effects of varying energy and nitrogen intake on, **3–17**
IV nutrition and, 13–14
Metabolic stress, and IV nutritional support, 36
Metabolism, cardiovascular function, and respiration, enteral nutritional support and, 41–50
stress, 30–31
Metaproterenol, formulation of, 323
potency of, 320
Metered-dose inhalers, for administration of beta-adrenergic drugs, 323–324
Methacholine, effect of, on ion transport in trachea, 266
Methicillin, for staphylococcal infections, 395
Methotrexate, for lung cancer, 511–512
Methscopolamine, uses of, 363
Methylprednisolone, 346
Methylxanthines, **331–340**. See also *Theophylline.*
actions and respiratory effects of, 487
classification of, 331
for COPD, 662–665
Metronidazole, uses and side effects of, 409–410
Miconazole, for pulmonary mycoses, 446–448
Micronutrients, guidelines for, in IV nutritional support, 33, 35
Modular enteral formulas, 54, 56
Moxalactam, 401
Mucociliary clearance, in trachea, effect of air types on, 250–251
ion transport, periciliary fluid and, interactions of, 262–269
Mucociliary system, tracheal, **247–258**
altered secretory function of, 252–255
dysfunction of, 251–255
normal function of, 248–251
Mucosa, airway, regulation of salt and water transport across, **259–272**
tracheal, ion transport by, 263–265
organic anion transport by, 268
Mucus, secretion of, laryngeal receptors mediating, 218
Muscle(s), abdominal, role of, in respiration, 571
intercostal, role of, in respiration, 570
respiratory. See *Respiratory muscles.*
scalene, role, of, in inspiration, 570
sternocleidomastoid, role of, in inspiration, 570
structure and function of, effects of starvation on, 95–96
tracheal smooth, **189–200**
effect of leukotrienes on, 192–193
myosin phosphorylation in, 189–190
relaxation mechanisms for, 191–192
sources of calcium for contraction in, 190–191
upper airway, **171–188**
abnormalities of, asthma and, 183
neuromuscular disorders and, 183
obstructive sleep apnea and, 182–183
activity of, alterations in blood pressure and, 177–178
bronchoconstriction and, 178
during resting breathing, 174–175
hypercapnia, hypoxia and, 175–176
hypertension and, 177–178
mechanics of, 179–182
mechanoreceptors and, 176–177
pharmacologic effects on, 178–179
visceral reflexes and, 178
anatomy of, 171–174
neural control of, 174–179
pathophysiology of, 182–184
Muscle afferent inputs, effect of, on upper airway muscle activity, 178
Myosin, composition of, 189
Myosin phosphorylation, of tracheal smooth muscle, 189–190

Nafcillin, for staphylococcal infections, 395
Nasal cycle, in humans, 167
Nasal patency, control of, in humans, 166–168
exercise and, 167–168
Nasal secretion, control of, 164–166
pharmacology of, 166
Nasal vasculature, 159–161
control of, 163–164
Nasoenteral feeding tubes, 51–52
Nebulizers, for administration of beta-adrenergic drugs, 324–325

Nerve fibers, distribution of, in upper respiratory tract, **201–209**
Netilmicin, dosing for, 417
Neuroleptic drugs, for COPD, 639
Neuromuscular disorders, abnormalities of upper airway function and, 183
Neuropeptides, and bronchial muscle tone, 267
Neuropeptide Y, in upper respiratory tract, 202–203
Nicotine, effect of, on upper airway muscle activity, 179
Nicotine gum, for smoking cessation, 555
Nitrogen, in enteral nutritional support, 52–53
Nitrogen balance, altered effects of nitrogen and energy intake on, 7–8
  and caloric intake, 4
  effects of fat *v* carbohydrate on, 4–5
  effects of varying energy and nitrogen intake on, **3–17**
  hypercatabolism for, consequences of, 7–9
  in depletion, 9–10
  interaction of nitrogen intake and caloric intake, effect of, on, 4
  protein intake and, 3
Nitrogen intake, and energy, effects of varying, on nitrogen balance, body composition, and metabolic rate, **3–17**
Noradrenaline, in upper respiratory tract, 201–202
Nose, innervation of, 159, 160
  muscles of, respiratory functions of, 172
  physiology of, **159–170**
  reflexes from, 161–163
  secretory tissues of, 161
Nucleotides, cyclic, in ion transport, 267
Nutrition. See also *Fasting*, *Malnutrition*, *Starvation*.
  and lung water, **127–130.** See also *Malnutrition*.
  and pulmonary parenchyma, **111–126.** See also *Lung(s)*.
  effects of, on respiratory muscles in COPD patients, 107–108
  in COPD, 528, **643–656**
    assessment of, 651–652
  in pulmonary rehabilitation, 652–654
  perioperative, 32
  to improve muscle contractility, in patients with airflow obstruction, 577
Nutritional assessment, 36
Nutritional repletion. See *Repletion*.
Nutritional status, effects of, on body fluid compartments, 127
Nutritional support, in catabolic phase, 30–31
  intravenous. See *Intravenous nutritional support*.
  malignancy and, 32
  stress and, 30–31

Ofloxacin, for tuberculosis, 436–437
Ohm's law, 261
Opiate analgesics, actions and respiratory effects of, 481–483
Organic anion transport, by tracheal mucosa, 268
Oropharyngeal collapse, 214–215
Overfeeding, thermic effect of, 12
Oxacillin, for staphylococcal infections, 395
Oxitropium, for bronchospasm, 365
Oxygen, administration of, during exercise, in COPD, 594
  evaluating need for, in COPD, 588–589
  pharmacology of, 495–499
  supplemental, administration of, 499
    clinical responses to, 498–499
  to improve muscle contractility, in patients with airflow obstruction, 576–577
Oxygen supply systems, COPD and, 677
Oxygen therapy, home, in COPD, **673–678**
  in pulmonary rehabilitation, 528–532

Palate, soft, muscles of, respiratory functions of, 172
Parasympathetic motor pathways, to trachea, **223–229**
Parasympathetic nerves, ganglia and, of trachea, 224–226
  in control of respiratory tract, 357–359
  preganglionic, of trachea, 223–224
Parenchyma, pulmonary, nutrition and, **111–126.** See also *Lung(s)*.
Penicillins, adverse reactions to, 397–398
  for respiratory medicine, 393–398
  pharmacology of, 399
Pentamidine, side effects and uses of, 421–422
Peptides, function of, in upper respiratory tract, **201–209**
  regulation of, in bronchoconstriction, 193–195
Peptide histidine isoleucine amide, and vasoactive intestinal peptides, in upper respiratory tract, 206–207
Periciliary fluid, ion transport, mucociliary clearance, and, interactions of, 262–269
Pharynx, muscles of, respiratory functions of, 173
Physical therapy, chest, in COPD, 610–616
    definition of techniques of, 610–612
    results of, 612–616
  in management of COPD patients, 525–527
Pleurodesis, tetracycline for, 512
Pneumonia, aminoglycosides for, 416
Pneumonitis, steroid therapy for, 349
Polyene macrolide antibiotics, for pulmonary mycoses, 439–443
Polymeric enteral formulas, 54–55
Polymyxins, clinical uses of, 418
Postprandial state, 44–45
Prednisolone, 346
Prednisone, 346
  and Cushingism, 344
  dosing of, 350
Pregnancy, IV nutrition during, 32
Progestational hormones, action and respiratory effects of, 487–488
Propranolol, effect of, on metabolic rate after glucose load, 12
Protein, body, dietary effects on, in normals, 3–5
  contractile, and tracheal smooth muscle, 189
Protein intake, and malnutrition, 23
  nitrogen balance and, 3
Protein–calorie malnutrition (PCM). See *Malnutrition*.
Protein requirements, for IV nutritional support, 33
Protriptyline, effect of, on upper airway muscle activity, 179
  respiratory effects of, 488
Pro-urokinase, for fibrinolysis, 476
Psychiatric disease, COPD and, 639
Pulmonary edema safety factors, 128–129
Pulmonary embolism, fibrinolytic therapy for, 476–477
Pulmonary mycoses, pharmacologic, kinetic, and adverse effects of drugs in, 441
  treatment of, drug interactions in, 449–450
    pharmacology of agents used in, **435–452**
Pulmonary rehabilitation, benefits of, 532–536
  breathing training in, 600–610
  chest physical therapy in, 610–616
  components of, 543–544
  definition of, 519–520
  education program in, 523
  exercise training program in, 523–525
  home care and, for ventilator-assisted persons, **679–691**

issue on, **519–691**
medical components in, 520–522
nutritional evaluation in, 528
nutritional support in, 652–654
occupational therapy in, 527
oxygen therapy in, 528–532
patient and family education in, **619–627**
factors that affect learning, 620–621
purpose of, 619–620
teaching process in, 621–626
physical modalities in, **599–619**
physical therapy in, 525–527
psychosocial support in, 530–532
smoking cessation in, 522–523
ventilatory muscle training and, 578–579
vocational training in, 527–528
Pulmonary rehabilitation program, sample patient contract, 548
individual formatting in, 543–544
organization of, **541–549**
physician's role in, 542–543
physical environment in, 545
planning in, 541–543
promotional strategies for, 545, 548
reimbursement procedures in, 545, 548
schedule options in, 544–547
Pulmonary stretch receptors, vagal afferent inputs from, 176
Pyrazinamide, for tuberculosis, 433–434

Quinolones, 410

Receptors, laryngeal, reflex responses of, **211–222**
Refeeding, effect of, on respiration and skeletal muscle function, **131–139**
response of respiratory system to, 136
strategies of, in patients with respiratory dysfunction, 133–136
Repletion, in COPD, case report of, 142–144
functional changes during, **141–151**
methods of, 142–143
in malnourished patients, 147–148
Resorcinols, metabolism of, 316
Respiration, cardiovascular function, and metabolism, enteral nutritional support and, 41–50
changes in, in upper airway resistance, 181–182
effect of refeeding on, **131–139**
function of upper airway muscles in, 171–188
Respiratory depressants, pharmacology of, **481–486**
Respiratory dysfunction, refeeding strategies in, 133–136
Respiratory efficiency, starvation and, 112
Respiratory failure, malnutrition and, 129
respiratory muscle strength and, 92
Respiratory gases, **495–504**
Respiratory-modulated receptors, reflex effects of, 211–217
Respiratory muscle(s). See also under *Muscle(s)*.
adaptation of, to acute and chronic stress, **79–88**
to chronic stress and training, 82–84
anatomic and mechanical considerations, 568–571
atrophy of, functional consequences of, 104
blood flow to, 80–81
coordination of, 572–574
COPD and, 147–149
dimensions of, and body weight, 92
endurance of, malnutrition and, 135
function of, **567–584**
and nutritional repletion, 96–97
structural and biochemical basis of, 101–102
therapeutic consideration to improve, 575–580
hypercapnia and, 107–108
hypoxia and, 107–108
influence of nutritional effects on, in COPD patients, 107–108
malnutrition and, **91–99**, 132–133, 147
metabolism of and blood flow to, 571–572
physiology of, 567–568
strength of, and body weight, 93
respiratory failure and, 94
substrate utilization and aerobic metabolism of, 81
trainability of, 81–82
undernutrition and, 91–95, **101–110**
Respiratory muscle fatigue, 573–575
and obstructive sleep apnea, 180
in pulmonary rehabilitation, 524
rest in, 579–580
Respiratory muscle training, in rehabilitation program, 524
Respiratory quotient (RQ), in starvation, 30
Respiratory stimulants, clinical uses of, 489–491
pharmacology of, **486–491**
Respiratory system, response of, to refeeding, 136
Respiratory tract, effect of anticholinergic agents on, 357–359
Rhinitis, allergic, steroid therapy for, 350
Ribavirin, for respiratory syncytial virus infection, 460–462
Rifampin, for tuberculosis, 432–433
Rimantadine hydrochloride, for influenza A infections, 455–457

Saligenins, metabolism of, 316
Sarcoidosis, steroid therapy for, 349–350
Scopolamine, pharmacology and side effects of, 362
structure of, 356
Secretory cells, of airway, regulation of, **231–237**
Sepsis, hypercatabolism following, 5–7
Serum albumin, and malnutrition, 24
Short-circuit current, in transepithelial ion transport, 274–275
Skeletal muscles, atrophy of, biochemical and hormonal mechanisms in, 104–107
function of, effect of refeeding on, **131–139**
plasticity of, and chronic stress, 81–84
Sleep, effect of, on upper airway muscle activity, 178
Sleep apnea. See *Apnea, obstructive sleep*.
Smoking, cessation of, **551–565**
a longitudinal perspective, 556–557
clinical interventions for, 553–555
coping with relapse in, 561–562
counseling patients for, 560–563
critical interventions for, 557–560
encouraging positive approach to, 563
factors leading to, 552–553
in management of COPD, 522–523
nicotine gum for, 555
pattern of, 556
social influence in, 555–556
social support for, 562–563
Sneezing, causes of, 162
Sniffing, causes of, 162
Specific dynamic action, energy expenditure and, 12

Starvation. See also *Fasting, Malnutrition, Nutrition.*
and emphysema, 112
effects of, on lung growth, 123
on muscle structure and function, 95–96
on protein content of lung tissues, 122
on surfactant function of lung, 120
experimental emphysema and, in COPD, 644–645
fuel stores during, 30
ketoadaptation during, 30
lung mechanics in, 114–118
lung morphology in, 118–120
lung weight in, 114
partial, body composition in, 20–21
respiratory efficiency, 112
respiratory quotient in, 30
static inflation and deflation V–P curves in, 115–116
Static inflation and deflation V–P curves, in fasting and starvation, 115–116
Steroids, **341–354**
classification of, 341–342
mode of action of, 342–344
side effects of, 344–345
treatment regimens, 350–352
Steroid let-down syndrome, 345
Steroid resistance, 352
Steroid therapy, indications for, 348–350
Steroid withdrawal syndrome, 345
Streptokinase, for fibrinolysis, 475–476
for pulmonary embolism, 477
Streptomycin, for tuberculosis, 417, 434
Stress, chronic, adaptation of respiratory muscles to, 82–84
and skeletal muscle plasticity, 81–84
metabolic, and IV nutritional support, 36
nutritional support and, 30–31
respiratory muscles and, **79–88**
Substance P, in regulation of bronchomotor tone, 193–194
in upper respiratory tract, 203–204
sneezing and, 162
Sulbactam, 397
Swallowing, laryngeal receptors mediating, 218
Sweat glands, secretory responses of, in cystic fibrosis, 293–294
Sympathomimetic bronchodilator(s), 659–662

Terbutaline, distribution of, 316–318
formulation of, 323
potency of, 320
subcutaneous administration of, 325
Terfenadine, uses of, 379
Tetracyclines, 404–406
for pleurodesis, 512
Theophylline, **331–340**
action and respiratory effects of, 487
adverse drug interactions with, 338
derivatives of, 331–332
dosage requirements for, 336
for COPD, 662–665
dosing methods of, 664–665
mechanisms of action of, 662
pharmacodynamics and pharmacokinetics of, 662–664
mode of action of, 332–333
pharmacokinetics of, 333–334
to improve respiratory muscle contractility, 577–578
toxicity of, 337–338, 665
treatment regimens with, 334–337
Thermogenesis, and metabolic rate, 11
Thiamphenicol, 407
Thiazinamium, side effects and uses of, 363–364
Thiazinamium chloride, uses of, 379
Thiazinamium methyl sulfate, uses of, 379
Thienamycin, 403
Thrombosis, definition of, 469
Ticarcillin, 396
Tissue-type plasminogen activator, for fibrinolysis, 476
TMP–SMZ. See *Trimethoprim–sulfamethoxazole.*
Tobramycin, dosing for, 417
Total parenteral nutrition (TPN). See *Intravenous nutritional support.*
Trachea, ciliary activity in, 248–249
ion transport in, effect of adrenergic agents on, 265–266
effect of cholinergic agents on, 266
liquid lining of, 249
mucociliary clearance in, **247–258**
mucociliary interactions in, 249–251
parasympathetic motor pathways to, recent morphologic and electrophysiologic studies on, **223–229**
surface epithelium of, cells of, 231–233
Transferrin, measurement of, in analysis of visceral proteins, 37
Triamcinolone, 347
Tricyclic antidepressants, actions and respiratory effects of, 488
Trimethoprim–sulfamethoxazole (TMP–SMZ), side effects and uses of, 420–421
Tuberculosis, aminosalicylate for, 436
capreomycin for, 434
clofazimine for, 436
cycloserine for, 435
drug therapy in, basic principles of, 425–428
ethambutol for, 434–435
ethionamide for, 435–436
isoniazid for, 429–432
kanamycin for, 434
ofloxacin for, 436–437
pyrazinamide for, 433–434
rifampin for, 432–433
rifamycin derivatives for, 436
streptomycin for, 417, 434

Undernutrition, effects of, on respiratory muscles, 91–95, **101–110**
Upper airway resistance, respiratory changes in, 181–182
Urokinase, for fibrinolysis, 476
Ussing chamber, 275

Vaccine, influenza, for COPD patients, 522
Vagal afferents, in upper airway muscle activity, 176
Vancomycin, side effects and clinical uses of, 418–420
Vasoactive intestinal peptide, in nasal secretion, 165–166
in regulation of bronchomotor tone, 193–194
peptide histidine isoleucine amide and, in upper respiratory tract, 206–207
Ventilation, home mechanical, costs of, 683–684
experience with, 681–683
follow-up care with, 688–689
rehabilitation and, **679–691**
rehabilitation process with, steps in, 684–688
maximal exercise, in COPD, 588
mechanical, chronic, physiologic basis for, 681
indications for, 680–681
Ventilatory muscle training, exercise endurance and, in COPD, 593
Verapamil, for contractility of tracheal smooth muscle, 190–191
Vinblastine, for lung cancer, 508–509

Vinca alkaloids, for lung cancer, 508–509
Vincristine, for lung cancer, 508–509
VIP. See *Vasoactive intestinal peptide.*
Visceral reflexes, effect of, on upper airway muscle activity, 178
Voltage, intracellular, and intracellular ion composition, 259
Walking, role of, in pulmonary rehabilitation, 524
Warfarin, for prolonged antithrombotic state, 473–474
Water, movement of, across epithelial tissues, 260
Water and electrolyte balance, effect of acute illness on, 8–9
Weight loss, emphysema and, 111–112
in COPD, 144–145, 643–644